

Appl. No : **10/615,524**
Filed : **July 3, 2003**

REMARKS

With this Amendment, Claims 1-15 are pending in the present application.

Obviousness under 35 U.S.C. § 103

Claims 1-5, 7-12 and 14-15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Azuma et al. WO Publication No. 95/25340. The Examiner notes that Azuma does not teach a deposition rate, does not specify a titanium concentration, and teaches a film that is thicker than the BST film recited in Applicants' claims. Nonetheless, the Examiner asserts that the claimed variables merely represent optimum ranges that would have been obvious to a person having ordinary skill in the art. The Examiner further asserts that "the specification contains no disclosure of either the critical nature of the claimed dimensions of any expected results arising there from [sic]." Applicants respectfully traverse each of the Examiner's rejections, each of the Examiner's assertions regarding what the prior art teaches and each of the Examiner's assertions regarding a lack of criticality in Applicants' disclosure.

Applicants respectfully disagree with the Examiner's assertion that the recited limitations lack criticality in the specification. As discussed throughout the specification of the present application, the problems associated with "haze" caused by irregularities in a BST film can be substantially eliminated by producing a film with a more uniform crystal orientation. The present application sets forth numerous embodiments of methods for making substantially haze-free films. For example, in paragraph [0008] on page 3, the specification states: "haze can be reduced by increasing the BST deposition temperature, decreasing the deposition rate and increasing the atomic percent of titanium in the BST film. These conditions favor the formation of a highly textured film, i.e., a film with a substantially uniform desired crystal orientation." Thus, the specification clearly describes the advantages achieved by adjusting the recited variables.

Moreover, Applicants respectfully disagree with the characterization of these limitations as being simply "optimum" ranges. Applicants submit that a rejection based on "optimum or workable ranges" is inappropriate where the prior art does not teach or suggest the desirability of the result achieved. As discussed in MPEP § 2144.05, "[a] particular parameter must first be recognized as a result-effective variable, i.e., a variable which

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achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation.” In re Antonie, 559 F.2d 618, 195 U.S.P.Q. 6 (CCPA 1977). Thus, for a rejection to be made based on “optimum or workable ranges,” the prior art must first identify the result which the variable achieves.

In one embodiment of the above-identified application, the problems associated with haze can be substantially eliminated by adjusting certain process parameters during deposition in order to produce a more uniform and haze-free film. As described for example at paragraph [0030] on page 7 states:

[0030] It has been found that the substantially uniform orientation illustrated in FIGURE 4A is induced by the high temperatures, preferably above about 580°C, used for BST deposition, which favors equilibrium. Moreover, the slow deposition rate used, preferably less than about 80 Å/min as described above, favors the formation of a more stable film, while the high Ti concentration in the BST produced, preferably between about 50 and 53.5 atomic percent, also favors a more haze-free film.

As noted by the Examiner, Azuma does not teach or suggest the desirability of varying a deposition rate or an atomic composition of titanium in a BST film in addressing the problem of haze. Accordingly, without disclosing this desired result or the variables to be adjusted, Azuma cannot be used to reject the claims on the basis that the parameters affecting this result are merely “optimum or workable” ranges that would be known to one of skill in the art.

For at least the above reasons, Applicants respectfully submit that Claims 1-5, 7-12, 14 and 15 are not rendered obvious by the prior art of record, including Azuma. Thus, Applicants respectfully request that the rejections be withdrawn.

Claims 6 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Azuma in view of the article by Joo. Applicants traverse these rejections as well. Applicants note that despite the Examiner’s assertion, the abstract of Joo does not teach deposition of a “haze-free” film. Moreover, the abstract of Joo does not provide the additional teachings which are lacking from Azuma as discussed above. Thus, Applicants respectfully submit that Claims 6 and 13 are also not rendered obvious by the prior art of record. Applicants request that the rejections of Claims 6 and 13 be withdrawn as well.

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CONCLUSION

The undersigned has made a good faith effort to respond to all of the rejections and objections in the present application and to place the claims into condition for allowance. Nevertheless, if any issues remain which can be resolved by telephone, the Examiner is respectfully requested to call Applicants' representative at the number indicated below in order to resolve such issues promptly.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 7/19/04

By: 
Lang J. McHardy
Registration No. 50,591
Agent of Record
Customer No. 20,995
Phone: (805) 547-5584

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